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स्टब स्वतः पकड़ टेपर — आयाम

(पहला पुनरीक्षण)

Indian Standard

STUB SELF-HOLDING TAPERS — DIMENSIONS

(First Revision)

ICS 25.060.20

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

June 2005

Price Group 2

Drills, Reamers and Threading Tools Sectional Committee, MGP 10

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Drills, Reamers and Threading Tools Sectional Committee had been approved by the Medical Instruments, General and Production Engineering Division Council.

This standard was first published in 1985. Based on experience gained and practical difficulties faced by users, this standard has been revised. This standard is also based on IS 1715 : 2002 'Self-holding tapers (*third revision*)'. In this standard following changes/modification have been made:

a) In the figure in Table 1, dimension 'e' has been added and dimension 'd' is shown clearly. The dimensions D_1, d, l_1, l_2, c and R are modified;

b) In Table 2, dimensions g, d_1, l_1, l_2, l_3, h and z are modified;

c) In Table 3, dimensions '($d_A - d_B$)' l_p and AT_D has been modified; and

d) In Table 4, dimensions '($d_C - d_D$)' l_p and AT_D has been modified.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

STUB SELF-HOLDING TAPERS — DIMENSIONS

(First Revision)

1 SCOPE

This standard specified dimensions for stub self-holding tapers. A method of measuring tolerance on external and internal tapers is given in Annex A.

2 REFERENCES

The following standards contain provisions, which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

IS No.	*Title*
1715 : 2002	Self-holding tapers — Dimensions (*third revision*)
2102 (Part 1) : 1993	General tolerances: Part 1 Tolerance for linear and angular dimensions without individual tolerance indications (*third revision*)
7615 : 2003	System of cone tolerances for conical workpieces from C-1 : 3 to 1 : 500 and lengths from 6 to 630 mm (*second revision*)

3 DIMENSIONS

3.1 Dimension of external stub self-holding taper with tanged and shank shall be as given in Table 1.

3.2 Dimensions of internal stub self-holding taper for tanged end shank shall be as given in Table 2.

4 TOLERANCES

4.1 Tolerances on Taper

Tolerances on external and internal stub self-holding tapers shall be as given in Table 3 and Table 4.

4.1.1 The tolerance on external tapers which is the difference of d_A and d_B in the measuring plane A and B shall not be less than ($d_A - d_B$) and not more than ($d_A - d_B$) + AT_D.

4.1.2 The tolerance on internal tapers which is the difference of d_C and d_D in the measuring plane C and D shall not be greater than ($d_C - d_D$) and not less than ($d_C - d_D$) − AT_D.

4.1.3 The tolerance AT_D is calculated with the taper angle tolerance AT according to formula (*see* IS 7615) :

$$AT_D = \frac{AT\alpha l_p}{10^6}$$

4.1.4 The taper length l_p is selected such that the distance of measuring plane B from small diameter of taper is approximately the same distance of measuring plane A from big diameter of taper.

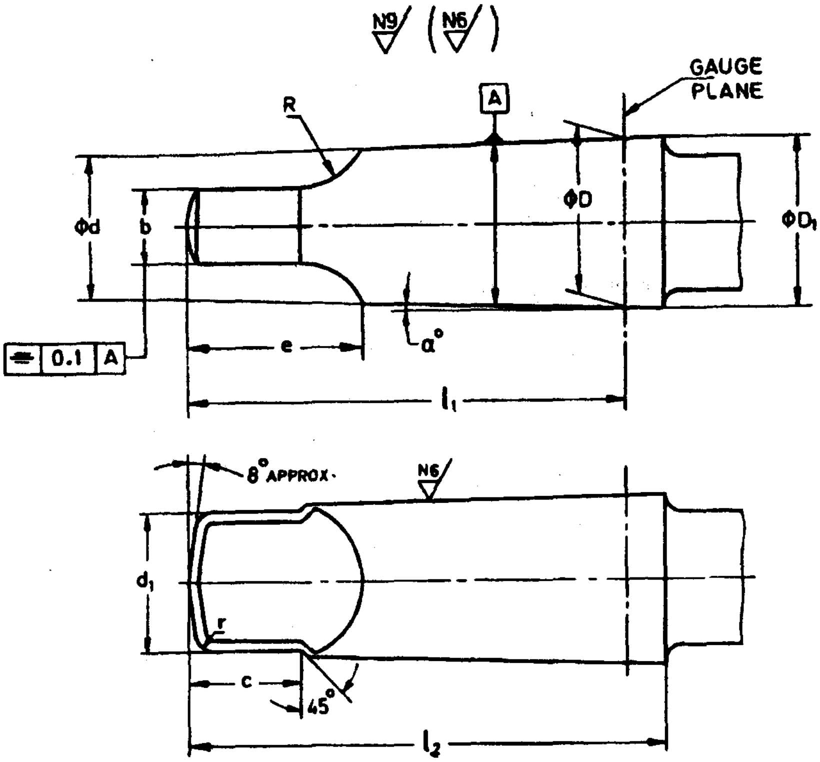
4.1.5 The tolerance covers straightness and circularity tolerances.

4.2 Tolerances on dimensions without specified tolerances shall be class medium as given in IS 2102 (Part 1).

Table 1 Dimensions of External Stub Self-Holding Taper with Tanged End Shank

(*Clause* 3.1)

All dimensions in millimetres.



Designation of Taper (1)	Taper on Dia (2)	α (3)	b h13 (4)	D (5)	D_1 Approx (6)	d Approx (7)	d_1 *Max* (8)	l_1 0 -1 (9)	l_2 (10)	C (11)	e *Max* (12)	R *Max* (13)	r Approx (14)
Stub Morse 0	1:19.212 = 0.052 05	1°29'27"	4.0	9.045	9.2	7.8	7.7	24.5	27.5	6.5	10.5	4	1
Stub Morse 1	1:20.047 = 0.049 88	1°25'43"	5.2	12.065	12.2	10.6	10.3	28.5	32.0	8.5	13.5	5	1.2
Stub Morse 2	1:20.020 = 0.049 95	1°25'50"	7.5	17.780	18	16	15.5	36.5	41.5	10	16	6	16
Stub Morse 3	1:19.922 = 0.050 20	1°26'16"	9.9	23.825	24.1	21.6	21.0	44.5	49.5	13	20	7	2
Stub Morse 4	1:19.254 = 0.051 94	1°29'15"	13.1	31.267	31.6	28.6	27.9	42.5	59.0	16	24	8	2.5
Stub Morse 5	1:19.002 = 0.052 63	1°30'26"	19.0	44.399	44.7	40.8	40.0	68.0	74.5	19	29	10	3

NOTES

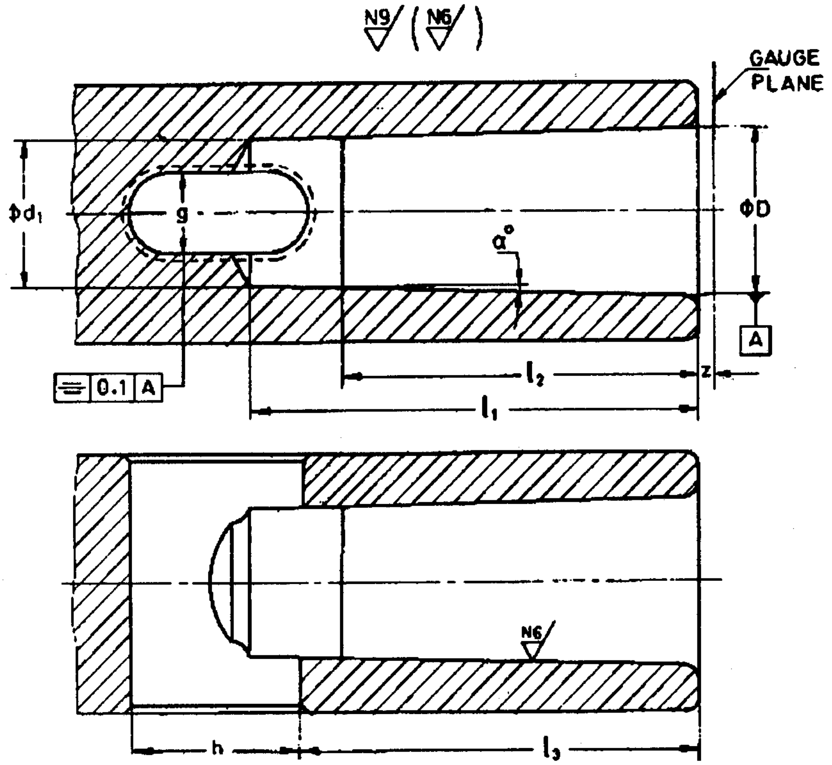
1 Taper diameter *D* and taper on diameter are basic dimensions from which the diameter D_1 and *d* have been calculated with the aid of nominal dimensions l_1 and l_2 and than rounded off to 0.1mm.

2 It is permissible to increase the length cover which the tang is turned to diameter d_1, but without exceeding *e*.

Table 2 Dimensions of Internal Stub Self-Holding Taper with Tanged End Shank

(*Clause* 3.2)

All dimensions in millimetres.



Designation of Taper (1)	Taper on Dia (2)	α (3)	*g* A13 (4)	*D* (5)	d_1 H11 (6)	l_1 *Min* (7)	l_2 Approx (8)	l_3 (9)	*h* (10)	*z* (11)
Stub Morse 0	1:19.212 = 0.052 05	1°29'27"	4.0	9.045	8.35	20.0	13.0	17.0	15	1.0
Stub Morse 1	1:20.047 = 0.049 88	1°25'43"	5.2	12.065	11.4	22.5	13.5	18.5	19	1.0
Stub Morse 2	1:20.020 = 0.049 95	1°25'50"	7.5	17.780	16.8	28.5	19.5	23.5	22	1.0
Stub Morse 3	1:19.922 = 0.050 20	1°26'16"	9.9	23.825	22.7	34.5	22.5	28.5	27	1.0
Stub Morse 4	1:19.254 = 0.051 94	1°29'15"	13.1	31.267	29.85	42.0	27.0	33.0	32	1.0
Stub Morse 5	1 : 19.002 = 0.052 63	1°30'26"	19.0	44.399	42.45	53.5	36.5	43.5	38	1.0

NOTES

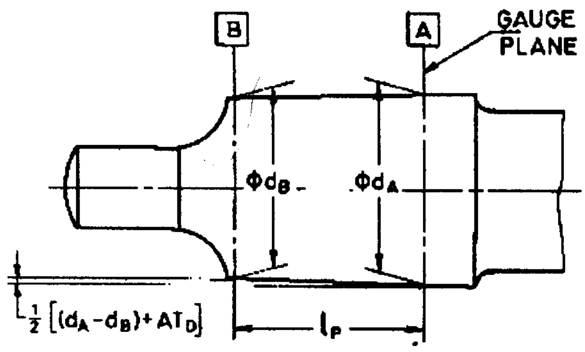
1 *z* is the maximum permissible deviation, outwards only, of the position of the gauge plane related to the basic size *D* from the nominal position of coincidence with the leading face.

2 Taper diameter *D* and taper on diameters are basic dimensions. Diameter d_1 is calculated with the aid of l_2 and *z* and rounded off to 0.1 mm.

Table 3 Tolerances on External Tapers — Taper Shanks

(*Clause* 4.1)

All dimensions in millimetres.

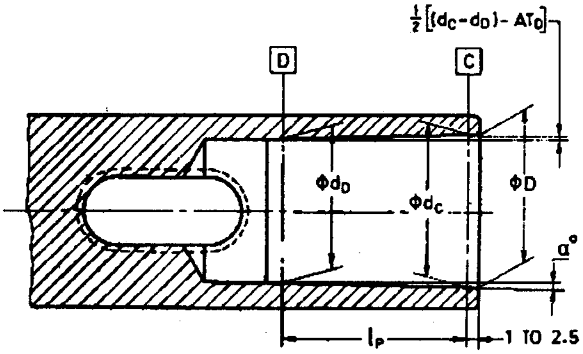


Designation of Taper (1)	d_A (2)	d_A-d_B (3)	l_p (4)	AT_D (5)
Stub Morse 0	9.045	0.573	11	0.007
Stub Morse 1	12.065	0.549	11	0.007
Stub Morse 2	17.780	0.749	15	0.009
Stub Morse 3	23.825	0.954	19	0.010
Stub Morse 4	31.267	1.143	22	0.011
Stub Morse 5	44.399	1.684	32	0.013

Table 4 Tolerances on Internal Tapers — Taper Sockets

(*Clause* 4.1)

All dimensions in millimetres.



Designation of Taper (1)	d_C-d_D (2)	l_p (3)	AT_D (4)
Stub Morse 0	0.468	9.0	0.007
Stub Morse 1	0.524	10.5	0.007
Stub Morse 2	0.724	14.5	0.009
Stub Morse 3	0.929	18.5	0.009
Stub Morse 4	1.091	21.0	0.011
Stub Morse 5	1.605	30.5	0.012

ANNEX A

(*Clause* 1)

METHOD OF MEASURING TOLERANCES ON TAPERS

A-1 MEASURING INSTRUMENTS

It is recommended that for inspection of tapers the diameters shall be measured with the help of optical measuring instruments or by the method of comparison with master gauges on comparators or by means of sine bar/centre method.

A-2 INSPECTION OF TAPER BY BEARING METHOD

The taper shank and socket shall be inspected by the method of taking bearing. Thin layer of blue colour paste can be applied for checking bearing seat. There shall be only one line of blue having width of 5 to 10 mm. A maximum of one complete turn with backward and forward motion shall be given. There shall be minimum 60 percent bearing from the bigger diameter for accepting the taper shanks and sockets.

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